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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/822,708	04/13/2004	Haruaki Watanabe	1309.43767X00	2911
24956	7590	08/01/2006	EXAMINER	
MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C. 1800 DIAGONAL ROAD SUITE 370 ALEXANDRIA, VA 22314			LEROUX, ETIENNE PIERRE	
			ART UNIT	PAPER NUMBER
			2161	

DATE MAILED: 08/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/822,708	WATANABE ET AL.
	Examiner Etienne P. LeRoux	Art Unit 2161

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 13 April 2004.  
 2a) This action is FINAL.                            2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-7 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-7 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 13 April 2004 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date 4/13/2004.

4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_.

*Claims*

Claims 1-7 are pending. Claims 1-7 are rejected as detailed below.

*Specification*

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

Claim 1 recites “a physical storage device, comprising said logical storage device, for storing said logically stored data in a physical fashion.” The specification does not provide support for the claimed physical storage device which comprises a logical storage device.

[0159] For example, in a second embodiment of a storage control sub-system according to the present invention, if the storage control sub-system forms unit pairs consisting of two storage units, taking one of the storage units as a primary storage unit and the other storage unit as a secondary storage unit, in such a manner that a snap shot is taken which copies the data in the primary storage unit to the secondary storage unit, then a plurality of logical storage devices are provided in the physical storage device, this plurality of logical storage devices comprises two or more first logical storage devices having a logical storage region which can be associated with a virtual storage region, and one or more second logical storage devices having a **logical storage region which cannot be associated with a virtual storage region**, the one or more second logical storage devices constituting a single real storage unit connected to the host terminal, and the storage control section forming a unit pair, wherein the real storage unit is taken to be a primary storage unit and the virtual storage unit is taken to be a secondary storage unit, and performing a snap shot.

As best examiner is able to ascertain, the above paragraph from the specification is the best support for the above claim limitation. However, closer scrutiny of the above specification

paragraph 159 shows a logical storage region which cannot be associated with a virtual storage region.

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

Claim 1 recites “said reported virtual storage capacity value is not changed while said virtual storage unit is recognized by said host terminal.” The specification does not provide support for preventing changing the storage capacity value while being recognized by the host terminal. The specification does not explain what is meant by “recognizing” by the host terminal.

### *Drawings*

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the following must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

- (1) physical storage device comprising said logical storage device
- (2) a virtual storage region
- (3) a storage control section for creating an association between a virtual storage region and a logical storage region

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing

sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The subject matter of this application, per the above, admits of illustration by a drawing to facilitate understanding of the invention. Applicant is required to furnish a drawing under 37 CFR 1.81. No new matter may be introduced in the required drawing.

Applicant is given a TWO MONTH time period to submit a drawing in compliance with 37 CFR 1.81. Extensions of time may be obtained under the provisions of 37 CFR 1.136(a). Failure to timely submit a drawing will result in **ABANDONMENT** of the application.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Pat No 5,440,708 issued to Takagi in view of US Pat No 6,883,083 issued to Kemkar and further in view of US Pat No 5,651,133 issued to Burkes et al (hereafter Burkes), as best examiner is able to ascertain.

**Claim 1:**

Takagi discloses a logical storage device having a logical storage region for storing data in a logical fashion; a physical storage device, comprising said logical storage device, for storing said logically stored data, in a physical fashion; a virtual storage unit having a virtual storage region and being implemented in said storage control sub-system in a case where a virtual storage capacity value is established, a memory for storing said established virtual storage capacity value [Takagi, Fig 1, Fig 12C]

Takagi discloses the elements of the claimed invention as noted above but does not disclose a storage control section for creating an association between a virtual storage region in said virtual storage unit and a logical storage region in said logical storage device if a read request or write request is received from said host terminal which recognizes said virtual storage

unit, and exchanging data between said logical storage region and said host terminal, via said virtual storage region. Kemkar discloses a storage control section for creating an association between a virtual storage region in said virtual storage unit and a logical storage region in said logical storage device if a read request or write request is received from said host terminal which recognizes said virtual storage unit, and exchanging data between said logical storage region and said host terminal, via said virtual storage region [col 2, lines 12-25]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takagi to include a storage control section for creating an association between a virtual storage region in said virtual storage unit and a logical storage region in said logical storage device if a read request or write request is received from said host terminal which recognizes said virtual storage unit, and exchanging data between said logical storage region and said host terminal, via said virtual storage region as taught by Takagi for the purpose of providing a backup copy of the data.

The combination of Takagi and Kemkar discloses the elements of the claimed invention as noted above but does not disclose wherein said storage control section reports the virtual storage capacity value stored in said memory, to said host terminal, and ensures that, after said host terminal has stored said virtual storage capacity value, said reported virtual storage capacity value is not changed while said virtual storage unit is recognized by said host terminal. Burkes discloses wherein said storage control section reports the virtual storage capacity value stored in said memory, to said host terminal, and ensures that, after said host terminal has stored said virtual storage capacity value, said reported virtual storage capacity value is not changed while said virtual storage unit is recognized by said host terminal [Burkes, col 15, lines 10-25]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to

modify the combination of Takagi and Kemkar to include wherein said storage control section reports the virtual storage capacity value stored in said memory, to said host terminal, and ensures that, after said host terminal has stored said virtual storage capacity value, said reported virtual storage capacity value is not changed while said virtual storage unit is recognized by said host terminal as taught by Burkes for the purpose of maintaining the virtual capacity at a threshold level [col 15, lines 10-25].

Claims 2 and 7:

The combination of Takagi, Kemkar and Burkes discloses the elements of claim 1 as noted above and furthermore discloses wherein a maintenance terminal for carrying out processing for maintaining said storage control sub-system is connected to said storage control section; and said storage control section receives a unit preparation request for preparing a new one of said virtual storage units, from said maintenance terminal or an external terminal connected to said maintenance terminal, and in response to said unit preparation request, supplies a graphical user interface comprising at the least an input box for said virtual storage capacity value, to said maintenance terminal or said external terminal, and causes the virtual storage capacity value input to said input box to be stored in said memory, as said established virtual storage capacity value [Burkes, col 15, lines 10-25].

Claim 3:

The combination of Takagi, Kemkar and Burkes discloses the elements of claim 3 as noted above and furthermore discloses wherein said storage control sub-system is capable to form a unit pair consisting of two storage units, one storage unit being taken to be a primary

storage unit and the other storage unit being taken to be a secondary storage unit, and is capable to perform a snap shot whereby the data in the primary storage unit is copied to the secondary storage unit; a plurality of said logical storage devices are provided in said physical storage device; said plurality of logical storage devices include two or more first logical storage devices having a logical storage region that can be associated with said virtual storage region, and one or more second logical storage devices having a logical storage region that cannot be associated with said virtual storage region; said one or more second logical storage devices constitute one real storage unit connected to said host terminal; and said storage control section performs said snap shot by forming a unit pair wherein said real storage unit is taken to be said primary storage unit, and said virtual storage unit is taken to be a secondary storage unit [Kemkar, col 2, lines 12-25].

Claim 4:

The combination of Takagi, Kemkar and Burkes discloses the elements of claims 1 and 3 as noted above but does not disclose wherein if said storage control section forms said unit pair comprising said virtual storage unit and said real storage unit, in a case where said virtual storage capacity value has not been reported to said host terminal, then a value equal to the storage capacity value of said real storage unit is reported to said host terminal as the storage capacity value for said virtual storage unit. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination of Takagi Kemkar and Burkes to include wherein if said storage control section forms said unit pair comprising said virtual storage unit and said real storage unit, in a case where said virtual storage capacity value has not been reported to said host terminal, then a value equal to the storage capacity value of said real

storage unit is reported to said host terminal as the storage capacity value for said virtual storage unit because there is a one-to-one correspondence between the real storage unit and the virtual storage unit [Kemkar, col 6, lines 10-18].

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Takagi, Kemkar and Burkes and further in view of Pub No US 2005/0262298 issued to Lubbers et al (hereafter Lubbers), as best examiner is able to ascertain.

Claim 5:

The combination of Takagi, Kemkar and Burkes discloses the elements of claims 1-4 as noted above but does not disclose wherein if said storage control section receives a read request or write request for the virtual storage unit from said host terminal, in a case where said real storage unit which is a partner for said virtual storage unit has not been found, then the storage control section sends a report to the host terminal indicating that the virtual storage unit is in an uninstalled state, and if the real storage unit which is said partner is subsequently found, it reports a value equal to the storage capacity value of said real storage unit, to said host terminal, as a storage capacity value for said virtual storage unit. Lubbers discloses a system which provides a data logging mechanism (e.g. a write history log unit) for storing commands and associated data for I/O transactions that occur when the remote storage device is unavailable e.g., a because the communication link has failed [paragraph 26]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination of Takagi, Kemkar and Burkes to include wherein if said storage control section receives a read request or write request for the virtual storage unit from said host terminal, in a case where said

real storage unit which is a partner for said virtual storage unit has not been found, then the storage control section sends a report to the host terminal indicating that the virtual storage unit is in an uninstalled state, and if the real storage unit which is said partner is subsequently found, it reports a value equal to the storage capacity value of said real storage unit, to said host terminal, as a storage capacity value for said virtual storage unit based on the teachings of Lubbers for the purpose of taking corrective action when the destination site is unavailable [paragraph 26].

Claim 6:

The combination of Takagi, Kemkar, Burkes and Lubbers discloses the elements of claim 1 as noted above and furthermore discloses wherein said storage control section reports the virtual storage capacity value stored in said memory, to said host terminal, if it has received a prescribed command from said host terminal [Lubbers, paragraph 26]

*Contact Information*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Etienne P. LeRoux whose telephone number is (571) 272-4022. The examiner can normally be reached Monday through Friday between 8:00 am and 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Safet Metjahic can be reached on (571) 272-4023. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Etienne LeRoux

6/1/2006

A handwritten signature in black ink, appearing to read "Etienne LeRoux".